SUPPORT FOR AMENDED CLAIMS

Claim 1 is hereby amended; support for this amendment is found in Claims 5, 6, and 8 as the limitations of these claims have been incorporated into Claim 1. Additional support for the amendment to Claim 1 can be found as follows: step (1) – page 3, lines 20–21; step (2) – page 3, lines 21–22; step (3) – page 3, lines 23–25; step (4) – page 3, lines 25–28 and page 7, lines 16–25. Claims 2–4, 7, 9–14, and 16–19 are also currently amended; support for these amendments are found in the claims as originally filed or previously presented. Claims 5, 6, and 8 are canceled. Claim 9 is amended only to depend on Claim 1. Claim 15 is as previously presented.

Support for amendments to other Claims is listed as follows:

- Claims 12, 21, and 22: page 11, lines 14–18;
- Claims 19 and 24: page 10, lines 14–19;
- Claim 20: page 5, lines 4–9;
- Claim 23: page 3, lines 15–19.

New matter has not been added.

Claims 1–4, 7, and 9–24 are currently pending.

REMARKS/ARGUMENTS

Claims 1–4, 7, and 9–19 relate to methods for producing catalytically active layered silicates, with one or more intercalated layers, comprising: (1) adding a metal solution to a layered silicate to form a mixture; (2) drying the mixture to generate metal atom pillars that support the respective intercalated layers, to obtain a dry mixture; (3) dry-mixing a transition metal salt where the transition metal is selected from the group consisting of copper, titanium, indium, cerium, and lanthanum with the dry substance obtained in (2) to generate a dry mixture; and (4) shock-heating the dry mixture obtained in (3) at a heating rate of about 100°C/10 min or greater to disperse the transition metal atoms into the intercalated layer to

achieve a homogeneous distribution of dehydrated metal atom pillars in the intercalated layers and-to simultaneously calcinate the dry mixture.

The inventors have found that the presently claimed methods for producing catalytically active, layered silicates are particularly effective for producing said silicates wherein a homogenous distribution of transition metal salts, which are responsible for the catalytic activity, throughout the intercalated layers is achieved. The cited references contain no disclosure or suggestion of the presently claimed method for producing catalytically active layered silicates. Accordingly, these references cannot affect the patentability of the present claims.

The rejection of Claims 1–6, 8–9, 12–14, and 16–17 under 35 U.S.C. § 103(a) as obvious over Li et al. (D1) in view of Heylen et al. (D2) and Fudala et al. (D3) is respectfully traversed. Applicants note that the Examiner later rejects Claim 15 under the same, which is not included in the recitation on Page 3 of the Office Action. Cited reference D1 only teaches the conventional wet ion exchange method where clay minerals are mixed with in a copper nitrate solution for forming intercalated, catalytically active, layered silicates. The dry mixing of step (3) in present Claim 1 is not taught by reference D1, nor are the shock-heating and calcining steps of (4) taught by this reference. Furthermore, the Examiner admits on page 4 of the Office Action that this reference does not teach the details of present Claim 1.

The combination of reference D2 with D1 may teach a method for producing aluminum oxide pillared silicates, i.e. these references may teach steps (1) and (2) of present Claim 1. However, the conventional "pillaring" method for producing silicates is still taught by the combination of these references. Therefore, one skilled in the art would not be taught the dry-mixing and shocking heating steps of present Claim 1. Furthermore, the given temperature rises clearly relate to the drying steps for the metal salt solution and the

calcining. In addition, reference D2 makes no mention of a metal salt, which is required for the dry-mixing step of present Claim 1.

Interestingly, the Examiner combined D3 with D1 and D2 to allege that a dry-mixing step could follow the conventional steps for producing the pillared silicates. This reference teaches forming one pillared silicate by the conventional process and another pillared silicate only by a dry-mixing process (see **Experimental** beginning on page 399). Even this reference does not combine or suggest combining the conventional steps with a dry-mixing step. Furthermore, D3 actually contrasts the performance of silicates produced by these two methods (see **Results and Discussion** beginning on page 400). Even if the conventional steps are combined with the dry-mixing step, which would not be taught by the combination of D1, D2, and D3, one skilled in the art would not be taught to shock-heat and calcinate the resulting dry mixture as such a step is not mentioned in any of these references.

Furthermore, D3 admits that the intercalation process should be optimized (p. 404), which is an important object of the present invention. This reference, either individually or combined with D1 and D2, would not teach one skilled in the art how to optimize the method for producing catalytically active, intercalated silicates. Cited References D1, D2, and D3 are scientific investigations into various properties of the respective silicates. These references do not discuss the optimization or simplification of the method for producing catalytically active, layered silicates.

The subsequent dry-mixing and shock-heating with calcinating processes, as claimed in present Claim 1, are not taught by any combination of the cited references. Accordingly, one skilled in the art would not be taught that the method for making silicates of present Claim 1 would be effective for achieving a homogenous distribution of transition metal salts throughout the intercalated layers of the silicates.

Accordingly, the rejection should be withdrawn.

The rejection of Claims 2–6, 8–9, 12–17 under 35 U.S.C. § 103(a) in view of the above cited references is respectfully traversed. These claims all depend on present Claim 1, which has been amended to obviate the outstanding rejection. Furthermore, the rejection of Claims 5, 6, and 8 is obviated as these Claims are canceled.

Accordingly, the rejection should be withdrawn.

The rejection of Claim 7 under 35 U.S.C. § 103(a) as obvious over D1 in view of D2, D3 and Long et al. (D4) is respectfully traversed. Present Claim 7 depends on present Claim 1. As argued above, references D1, D2, and D3, either individually or combined, would not teach one skilled in the art the method of present Claim 1. Reference D4 also teaches the conventional "pillaring" method and combined with the above-mentioned references would not teach the method of present Claim 1.

Accordingly, the rejection should be withdrawn.

The rejection of Claims 10–11 and 18–19 under 35 U.S.C. § 103(a) as obvious over D1 in view of D2, D3 and Ward et al. (D5) is respectfully traversed. Present Claims 10–11 and 18–19 depend on present Claim 1. Cited reference D5 is silent in regard to the method of producing pillared silicates. Therefore, this reference in combination with D1, D2, and D3 would not teach one skilled in the art the method of making such silicates as claimed in present Claim 1.

Accordingly, the rejection should be withdrawn.

The objection to Claim 4 is obviated by amendment. Accordingly, the objection should be withdrawn.

Applicants submit that the application is now in condition for allowance, and early notification of such action is earnestly solicited.

Respectfully submitted,

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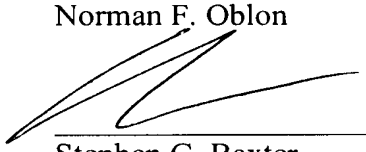

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